

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 January 2004 (22.01.2004)

PCT

(10) International Publication Number
WO 2004/008741 A2

(51) International Patent Classification⁷: **H04N 5/21**
(21) International Application Number:
PCT/GB2003/003050
(22) International Filing Date: 14 July 2003 (14.07.2003)
(25) Filing Language: English
(26) Publication Language: English
(30) Priority Data:
0216257.6 12 July 2002 (12.07.2002) GB
(71) Applicant (for all designated States except US): **SNELL & WILCOX LIMITED** [GB/GB]; 6 Old Lodge Place, St. Margaret's, Twickenham, Middlesex TW1 1RQ (GB).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

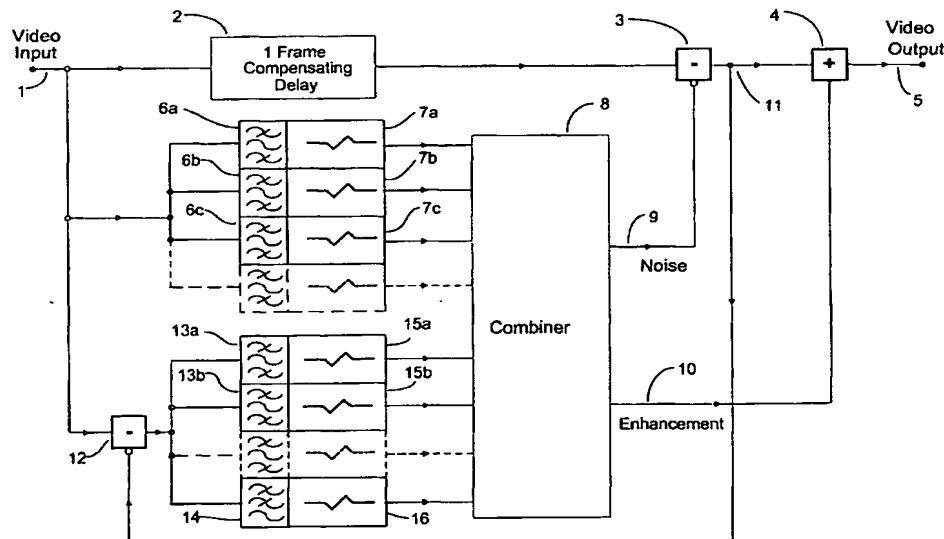
(72) Inventors; and
(75) Inventors/Applicants (for US only): **WESTON, Martin** [GB/GB]; 7B Weston Road, Petersfield, Hampshire GU31 4JF (GB). **STEINBERG, Avigdor** [RU/GB]; 36 Larcombe Road, Petersfield, Hampshire GU32 3LS (GB).
(74) Agents: **GARRATT, Peter, Douglas et al.**; Mathys & Squire, 100 Gray's Inn Road, London WC1X 8AL (GB).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **IMPROVED VIDEO PROCESSING**



(57) **Abstract:** A video noise reducer divides a signal into spatial frequency bands and derives both recursively and non-recursively filtered signals for each band. Both signals are processed non-linearly. These signals are combined in ways that vary between the bands to provide a noise signal and a detail signal. A clean video signal with all noise removed is used in the recursive loop. The output signal includes detail enhancement and may have a subjectively pleasant amount of noise added back.